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II. CARIGUEYA, Seu Marsupiale Americanum Masculum.

Or,

*The Anatomy of a Male Opossum : In a Letter to
Dr Edward Tyson, from Mr William Cowper,
Chirurgeon, and Fellow of the Royal Society, London.*

*To which are premised some further Observations on the
Opossum ; and a New Division of Terrestrial
Brute Animals, particularly of those that have their
Feet formed like Hands. Where an account is
given of some Animals not yet described. By Ed-
ward Tyson, M. D. Fellow of the College of
Physicians and of the Royal Society.*

Having formerly given the *Anatomy* of a *Female Opossum* ; for compleating the *History* of this *Animal*, I intended likewise to add that of the *Male*. And tho indeed I had an opportunity of doing it much sooner, by the favour of *Arthur Bayly, Esq*; a Merchant here in *London*, who presented me with two : Yet I am well pleased to find my self prevented herein by a Friend, whose great Skill in *Dissecting*, as well as *Designing* the *Parts* to be represented, renders him altogether fit for such an *Undertaking*, I shall refer the *Reader* therefore to the *Account* *Mr Cowper* has drawn up and sent me, of the *inward parts* of the *Male Opossum* : And shall only beg leave to observe some few things, that may tend to

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the illustrating the History of this *Animal*, omitted in the Anatomy of the *Female Opossum*, printed in the *Philosophical Transactions* No 239. for the Month of April 1698.

And in the first place, whereas pag. 107. I queried to what *Species* in the *Prædicament* of *Animals* this *Creature* might properly be reduced? Now having upon dissection observed the *Penis* to be fleshy, and to have no *Bone* in it; I find it cannot be referred to the *Dog* or *Weasel* kind, as some have thought; and what *Piso* means by his *Glires majores montani*, to which he refers it, I shall not here enquire. I must confess we cannot be at a certainty in this matter, unless we had a more perfect Enumeration and Description of the several sorts of *Animals* that are in the World; and by a strict Enquiry into their *inward* as well as *outward* Parts, observed, how gradually they differ from one another; by easie and gentle steps, the intermediate *Species* linking the whole together. However till this can be attained, every little help will contribute somewhat.

To give therefore my Thoughts on this subject, I shall here propose a *Division* of such *Terrestrial Animals*, as have many *divided Claws* and *Nails* at the end of them into

Animalia { *Xειρ. δάκτυλα seu Manu digitata*, i. e. whose Feet resemble Hands, and have Fingers rather than Toes.
 { *Πόδο-δάκτυλα seu Pede digitata*, i. e. whose *digiti*, from the order of their Position and Shortness, as also Uses, more resemble Toes than Fingers.

For tho our Language makes a sufficient distinction between them, by calling one *Fingers*, the other *Toes*; yet the *Greek* and *Latin* do not; for *δάκτυλος* and *Digitus* signify

fie those on the *Hand*, and *Feet* likewise. To discriminate them therefore they are obliged to add another word, as *Digitus Manūs*, or *Digitus Pedis*; which sufficiently justifie our Distinction of Χειροδίτυνα, and Ποδοδίτυνα.

Now we may observe these Differences between the *Fingers* and *Toes*, viz. that the *Fingers* are much longer, having usually a *Thumb* set at a distance from the Range of the other *Fingers*; and are so contrived, for the better holding what they have a mind to, and especially in these Animals, to assist them in *climbing* Trees, &c. for catching their Prey. Whereas the *Toes* are shorter, and are set in a more even range together, and better contrived for *swift running*, by which way this other sort of Animals take their Prey.

This latter sort we shall not insist on here, but rather give a *Subdivision* of the former, viz. those Animals which have their *Feet* formed like *Hands*. Now where there is a *Thumb*, tho we may esteem the *Hand* there more perfect, yet I find 'tis not always necessary; for in several Animals 'tis wanting, as will appear by the following *Scheme*; which I propose here only as an *Essay* or *Hint*, by farther Observations to be inlarged and amended, rather than as one justly adapted and compleat; for I doubt not but there are several Animals not here mentioned, that may be reduced under some of these Heads; and it may be some here specified, upon second Thoughts may be more fitly ranged otherwise. However at present let this serve.

(1568)

Animalia ~~Xenos~~ ~~animata~~, Quorum

Omnes sunt Manu-formes, seu Animalia Quadru-mana.

Cum Pollice in Omni Pede sc.

Simia } Caudata.
Romack.
Coati Brasil.
&c.

Pedes

Sine Pollice in Pedibus.

Anterioribus

Vantrevan.
Sciurus.
Mus, &c.

Posterioribus.

Genus Felinum.

Duo tantum sunt Manu-formes. sc. vel

Anteriores

Cum Pollice
Mantegar,
&c.

Sine Pollice.

Cuandu Brasil. Margravia.
Tlaquatzin Spinosum Hernandez.
Hystrix.
Tamandua Brasil.
&c.

Posteriores.

Cum Pollice
Carigueya. S. Opossum,
&c.

Sine Pollice.

Under

Under the first Member of this Division I include the *Ape* and *Monkey* kind, which as I have shown in my Discourse of the *Ourang Outang*, ought rather to be reckoned a *four handed* than a *four footed* Animal. And considering how large a Species of Animals may be reduced under this *Quadrumanous* kind, agreeing in this particular, tho in others different, I think it but just to assign them a General *Classis*, afterwards to be subdivided according to the gradual differences they have from one another.

The *Romack* therefore, tho in the Head and Face much different from the *Monkey* kind, yet being *Quadrumanous*, and on each *Hand* having a *Thumb*, I reduce under this Head. This Animal was brought alive from *Fort St George*. Whether it is described by any, or what other Names 'tis call'd by, I do not know. Hereafter it may be I may give a description of this and some others of the *Ape* and *Monkey* kind, in an *Appendix* to my discourse of the *Ourang Outang*. And because in its face and head it so much resembles a *Fox*, and in the rest of its Body a *Monkey*, for the present shall call it *Αλων-Πίθης*, *Vulpi-Simia*, or the *Fox Monkey*. But the next I have mentioned in this Class, the *Coati* of *Brasil* and *Virginia*, or the *Rackoon* or *Rattoon*, tho in its Body it does not resemble the *Monkey* kind, yet because it has hands like a *Monkey*, as *Margrave* tells us, I place likewise here; as may be all others, whose *Feet* are all formed like *Hands*, and have a *Thumb* in each.

For there are some that have not a *Thumb* on their *fore feet*, and others that want one on the *binder*.

In the number of the former may be reckoned the *Vantrevan*, the *Squirrel* kind and *Mouse* kind, or any others that may be observed to have all their *Feet* formed like *Hands*, only on their *fore Feet* do want a *Thumb*.

The *Vantrevan* (as 'twas called by the Person that shew'd it here in *London*) altogether resembles a *Monkey* which on the *fore Feet* had only 4 long *Fingers* and no *Thumb*.

Tis

It is a beautiful Creature, very brisk and nimble in motion and loving; has a very long *Tail*, by which it suspends its Body, as does the *Opossum*.

The *Squirrel* kind on the *fore Feet* have 4 long *Fingers*, on the *hind* five, and one like a *Thumb*. It makes use of its *fore Feet* like *Hands*, in holding up its Food to its *Mouth*, and lives on *Trees*, as do the *Monkeys*. But the affinity between the *Monkey* and *Squirrel* kind does better appear by some *Monkeys* I have seen, which on the *Belly* have a large thick *Furr*, and a thick brushy *Tail* like the *Squirrel*, whereas usually on the *Belly* the *Ape* and *Monkey* are thinner of *Hair*, and that on their *Tail* is shorter. This sort of *Monkey* I call therefore the *Squirrel Monkey* or *Sciuro Pithecus*, and have made a figure of one of them. But its *Face* more resembled a *Man's* or an *Ape's*, as likewise its *Teeth*, and in these respects is much different from the *Squirrel* kind.

Nearer to the *Squirrel* comes the *Mouse* kind, which in the shape of its *Head*, the long *Teeth* before, and the large and prominent *Eyes*, more resembles the *Squirrel* kind, and makes use of its *fore Feet*, as *Hands*, in feeding its self, where it has only 4 *Fingers* without a *Thumb*, but on its *hind* has 5, of which the inwardmost and outwardmost are placed at a distance from the Range of the 3 middle *Fingers*, like 2 *Thumbs*, as may be observed in some of the *Lizard* kind.

Why we should include the *Cat* kind in the number of the *Animalia* *exig-đicula* some may question, since their *Feet* seem rounder, and to have rather *Toes*, than *Fingers*. But we may observe that it uses its *fore Feet* like *Hands* in climbing and catching its *Prey*; and when it does so, it exerts its *Claws* and lengthens them; but when it uses its *Feet* in going and running, it shortens them, that being most convenient for that purpose, so that 'tis well provided for both, and its *Digitæ* are of a middle nature between *Fingers* and *Toes*, as they are lengthened or shortned.

shortned. And we may observe on each *fore Foot* there is a *Pollux* or *Thumb* set at a distance from the range of the other *Claws*, whereby they more resemble *Hands*, and on the *hinder Feet* there are only 4 *Digiti* without a *Thumb*.

We come next to those Animals that have only two *Feet* formed like *Hands*, and those are either the *Fore-feet*, or the *Hinder*.

Those whose *Fore-feet* only are formed like *Hands*, have either a *Thumb* there, as the *Mantegar*, &c. or have only four *Fingers*, without a *Thumb*, as the *Crandu*, &c.

The *Mantegar* is an Animal not described as I know of by any Author, and the strangest that I have seen. It is about the bigness of a Mastiff Dog; it measured from the end of its *Nose* to the *Anus* 3 foot 2 inches; the Girth of the *Body* 2 foot 2 inches; the *Head* 14 inches long; the *Forehead* 5 inches broad; the *Head* somewhat resembling an Horse's; the *Nostrils* large; the *Nose* of a deep *Cinnabar* Colour, and the *Bones* of the *Nose* depressed lower than those of the *Upper Jaw*, where the *Skin* was of an *Azure* blew Colour; a large Tuft of Hair on the *Forehead* and likewise under the *Chin*; the forepart of the *Body* and inside of the *Arms* and *Legs* almost bare of hair, the *Hair* on the outside of them, of a mottle brown and *Olive* colour; on the *Back* blackish: There were *Mammae* on the *Breast*; an *Umbilicus*; and the *Preputium* without a *Frenum*, as in the *Ape* kind; the *Preputium* of a *Vermilion* Colour; the *Scrotum* of an *Azure*; it had no *Tail*; 'tis very fierce, having 2 long *Tusks* in the *Upper Jaw*, and very lascivious; the *Fore-feet* perfectly resemble *Hands*, having long and thick *Fingers*, and a *Thumb*, and all the *Nails* of those *Fingers* flat; the *Nails* on the *hinder Toes* and *Fingers* imbricated, not flat; and tho the *Claws* were pretty long, and somewhat imitating *Fingers*, yet the *Thumb* not so perfect, and the whole different from the *Fore feet*. When sitting and supporting its self by a

Stick

Stick in one hand, being thus erect, and holding a Cup in the other, it would drink out of it, and not lap; its Food was chiefly Fruits. But of this more it may be another time.

Amongst those Animals whose *Fore-feet* are like *Hands* and have no *Thumb*, I reckon the *Porcupine* kind, as the *Cuandu* of *Brasil*, a sort of *Porcupine* described by *Margrave* and *Jo. Nieuhoff* (*Voyages* pag. 18.) which on the *Fore-feet* hath but 4 *Fingers* on the *binder* 5. Therefore, as *Margrave* observes, for want of a *Thumb*, it is but slow in climbing *Trees*; but the better to help himself, it twists its *Tail* about a *Bough*, to save its self from falling. And much alike, if not the same, is the *Tlaquatzin Spinosum* of *Hernandez*. So the *Common Porcupine*, before has 4 *Fingers*, behind 5. So the *Tamandua* of *Brasil*, or *Ant-Bear*, before has but 4 *Fingers*, where the want of *length* in the *Fingers*, is supplyed by that of the *Nails*, and behind has 5 *Toes*. But I must confess there must be some Allowance made, for ranging this *Anomalous Animal* (as *Mr Ray* calls it) here. But because he *climbs* *Trees*, and in doing this makes use of his *Tail*, as some others here mentioned do, I was willing to put him into the *Croud*. And, unless it can be otherwise better ranged, we may likewise shuffle in here the *Ai*, *Ignavus*, or *Sloth*, because it *climbs*, and lives on *Trees*, and has a *Head* not unlike an *Ape's*; and, as *Margrave* assures us, two *Teats* on the *Breast*, but on each *Foot* had but three *Claws*, with very long *Nails*, like the *Tamandua*, and its *Feet* being very narrow and thus defective in *Toes*, 'tis very slow in Motion.

Now to conclude this *Scheme*, Amongst the Animals whose *binder Feet* only are like *Hands*, is to be reckon'd the *Carigueya* or *Opossum*; which having described at large in the *Anatomy* of the *Female Opossum*, I shall not insist farther on it here: and if there be any other Animals that have their *binder Feet* formed like *Hands*, either with

or

or without a Thumb ; they may be reduced hither, my chief Design in this Scheme being (as near as I could) to include all those Animals that are observed to *climb* or live on *Trees*, into a Class together ; and they being observed to have their *Claws*, either all or many of them, formed like *Fingers*, I place them therefore under this general Title of *Animalia xerogdaxua*.

Now, begging pardon for this Digression, we shall proceed in our Observations on the *Male Opossum*, omitted in the account given of the *Female*, and here we shall be brief.

Therefore pag. 112. in describing the *Ears*, I had not an opportunity of observing that *white Rimm* that Incircles them, which is very beautiful : for when in Health, for the breadth of two lines or more, there runs an *Edging* round the *Verge* of the *Ear* of a perfect *Milk white* Colour. But the *Ear* here being so very thin and tender, 'tis easily affected by cold or illness, and then this white part becomes jagged and crimped, as if burnt up, and the whiteness disappears ; as it happened in this last subject before its death, as well as the first, which occasioned my not observing it then. 'Tis on this account that *Margrave* in his Description of the *Tai-ibi* of *Braſile*, which now I take to be the *Male Opossum*, saith, it has *Aures subrotundas, molles, graciles albas, teneras ut Charta molles*, not that the whole *Ear* was *White*, but only the *Edges*.

But what I was most desirous to know, was whether the *Male* had that *Marsupium* or *Pouch* for receiving the *Young*, as is affirmed by some I have named pag. 124. Mr *Cowper* in the Subject he dissected, neither observed the *Pouch* nor the *Muscles* belonging to it, as has been described in the *Female* : Nor indeed did I in that I dissected. Only this I took notice of when first I had it ; that the *Skin* here seemed to be looser ; so that with my finger I could easily thrust it in, and by turning it round, could form for the present a *Pouch* ; but this would easily

turn out again, upon withdrawing my fingers. Whether therefore 'tis capable of being formed into a *Pouch* or *Marsupium* upon occasion, I shall leave as a Quæry to be resolved by those that live where they breed, Whether they ever observe the *Male* to receive the *Young* ones as do the *Females* ?

However, in the *Male* there were those Bones I call *Marsupialia*, and I observed Muscles running from them to the hinder Legs, which, no doubt, are very serviceable to them in drawing up their Bodies, as I find Mr *Cowper* has likewise remarked.

I shall further add, to confirm what *Oppian* and others I have named (pag. 126.) write concerning *Fishes* receiving their *Young* ones into their Bellies ; that Mr *Herbert* in his Travels (*Lib. I. Pag. 23.*) saith, that in their Voyage, they took a *Shark*, 9 foot and a half long ; and found in her *Paunch* 55 young ones, each a Geometrical foot in length ; all which, he adds, go out and in at pleasure.

I shall conclude this Paper with some few remarks I made upon the *Brain*, since in the *Female* I had not an opportunity of doing it, and I find Mr *Cowper* has omitted it in the *Male* ; but for all the rest, shall refer to his account. Wherein the Reader will find that the *Organs of Generation* in the *Male* are no less surprizing and remarkable than in the *Female* ; and in both they are different from any other Animal that I have met with.

Now as to the *Brain*, I observed that being taken out of the *Cranium* it weighed two drams two scruples. I did not find either in the *Cerebrum*, those *Anfractus* ; or in the *Cerebellum* those *Circilli* which we usually meet with in other *Brains*. The whole was of an Oblong figure, and seemed to be divided into three Parts, i. e. The *Cerebellum*, the *Cerebrum*, and that part of the *Cerebrum* which was projected into the *Rostrum*. For by the Pinching in of the *Cranium* here, the fore part of the *Cerebrum*, from whence issued the *Processus Mamillares* and *Olfactory Nerves*

Nerves, was by this Constriction, remarkably distinguished from the *Cerebrum*; like an *Anterior Brain*. In the *Vermin* kind, and those that have a long *Rostrum*, I have observed the like. For Nature here seems to give them more particularly the advantage of the *Sense of Smelling*, for finding out their Prey, or avoiding the Danger they would shun.

So likewise I observed the *Optick Nerve*, as likewise the *Eye* to be large; the better to look out for the one, or the other. And when I have mentioned the *Auditory Nerves* to be large likewise for the same reason, to give them a quick sense of hearing any sudden Noise, and so to avoid the Danger, these were the greatest Remarks I made upon the *Nerves*.

It was observed that it saw best in the twilight, and not so well in the bright Sun; which I was easily brought to believe, because it was then to seek out for its Prey.

In the *Eye* I observed the *Membrana Nictitans*; The *Glandula Lachrymalis* was large and oblong; there was the *Musculus septimus suspensorius*; and the *Crystalline Humour* was large, very transparent, and almost of a globular figure; the *Eye* or *Iris* black.